

WHAT IS CLAIMED IS:

1. A transformed bacterium for use as a production cell, and having:
 - (a) a lipooligosaccharide or lipopolysaccharide having a core region containing a terminal heptose;
 - (b) an enzyme capable of adding an acceptor molecule to the terminal heptose; and
 - (c) an inserted sequence of isolated DNA encoding glycotransferase forelongation of the acceptor molecule by sequential addition of saccharide monomer to produce ologosaccharide or polysaccharide.
2. The bacterium of claim 1, which is Gram-negative.
3. The bacterium of claim 2, which contains an *rfe* gene.
4. The bacterium of claim 3, which contains an *lsgG* regulatory gene.
5. The bacterium of claim 2, which is *Escherichia coli* or *Salmonella minnesota*.
6. The bacterium of claim 2, which is *Escherichia coli* K12 strain JM 109.
7. The bacterium claim 1, which has terminal heptose on a kdo core.
8. The bacterium of claim 1, wherein the enzyme is capable of adding an acceptor molecule which is *N*-acetyl glucosamine.
9. The bacterium of claim 1, having inserted an isolated DNA sequence encoding a glycotransferase catalysing the synthesis of an oligosaccharide of *Haemophilus influenzae*, *Neisseria spp.* or *Salmonella spp.*

10. A process for producing a complex carbohydrate, which comprises the steps of:

- (a) inoculating production cells which are bacteria according to any of claims 1-9 into a culture medium capable of supporting the growth of said production cells;
- (b) allowing the growth of said production cells; and
- (c) recovering the complex carbohydrate from the culture medium.

11. The process of claim 10, which comprises the steps of extracting chimeric lipooligosaccharide or lipopolysaccharide from the cultured cells, hydrolysing the extracted lipooligosaccharide or lipopolysaccharide, and recovering the resulting oligosaccharide or polysaccharide.

12. The process of claim 10, wherein the oligosaccharide or polysaccharide is incorporated into a vaccine against a Gram-negative pathogen.